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SUMMARY OF THE INVENTION

This invention relates to an isolated osteocalcin fragment derived from human urine, said fragment being characterized in that at least one of the glutamic acids in the position 17, 21 and 24 of the amino acid sequence

Tyr-Leu-Tyr-Gln-Trp-Leu-Gly-Ala-Pro-Val-Pro-Tyr-Pro-Asp-Pro-Leu
17 21 24 30
Glu-Pro-Arg-Arg-Glu-Val-Cys-Glu-Leu-Asn-Pro-Asp-Cys-Asp-Glu-LeuAla-Asp-His-Ile-Gly-Phe-Gln-Glu-Ala-Tyr-Arg-Arg-Phe-Tyr-Gly-Pro-

Val (SEQ ID NO:2)

is gamma-carboxylated.

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BRIEF DESCRIPTION OF THE DRAWINGS

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Figure 1 A shows the nucleic acid (SEQ ID NO:1) and the amino acid (SEQ ID NO:2) sequences of the synthetic human osteocalcin insert (SEQ ID NO:3). Figure 1 B shows plasmid vector pGEX-3X (Pharmacia). The arrow indicates the SmaI-ligation site of the hOC insert;. The pfXa (protease factor Xa) cleavage site is located after the Ile-Glu-Gly-Arg -sequence (residues 1-4 of SEQ ID NO:4).